



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

February 15, 1994

Docket Nos. STN 50-454, STN 50-455
and STN 50-456, STN 50-457

LICENSEE: Commonwealth Edison Company (CECo)
FACILITIES: Byron Station, Units 1 and 2 and Braidwood Station, Units 1 and 2
SUBJECT: MEETING SUMMARY OF FEBRUARY 1, 1994

On February 1, 1994, a public meeting was held between the NRC and Commonwealth Edison Company (CECo or the licensee) to allow CECo to respond to questions asked by the NRC staff during a January 15, 1994, conference call regarding a proposed battery replacement amendment for Byron and Braidwood stations.

The amendment would allow the licensee to replace Gould, 125 Volt D.C. batteries with the new AT&T batteries. In this submittal, the surveillance requirements would allow the batteries to be operable down to 80% of battery's rated capacity. The NRC staff questioned this requirement and commented that because the capacity for the new AT&T batteries is supposed to increase over time and because this is a new application for these batteries the licensee should consider a higher capacity value for operability.

At the meeting, CECo staff fundamentally agreed with the NRC staff's comments, and proposed to increase the capacity value for operability from 80% to 95% of the rated capacity. In addition, the licensee proposed to revise the definition for battery degradations. In the proposed definition the batteries show signs of degradation when their capacity drops below 100% of manufacturer's rating or if their capacity drops more than 5% from the previous test. These values were 90% and 10%, respectively, in the original submittal. The licensee made these changes to respond to NRC's concerns, to improve safety and to allow CECo to benefit from the battery manufacturer's warranty.

The NRC staff agreed with the new proposed capacity values because they were more conservative and improved safety. The NRC staff also recommended to the licensee to clarify the word "average" in the term "5% of capacity from its average on previous performance tests" in the technical specification. The technical specifications would be clearer if the term is modified to state "5% of capacity from its previous performance test". Finally, the staff asked the licensee to analyze crystal stratification on the battery plates and report their findings to the NRC.

The licensee agreed to submit the revised capacity values in a supplement to the original amendment request, to provide stratification study results to the NRC, and to clarify the "average previous test" term.

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At the conclusion, the NRC staff informed the licensee that the safety evaluation review for this submittal will be completed after receiving the supplemental information.

Original Signed By:

Ramin R. Assa, Acting Project Manager
 Project Directorate III-2
 Division of Reactor Projects - III/IV/V
 Office of Nuclear Reactor Regulation

Enclosures:

1. Attendance Sheet
2. Meeting Handout

cc w/enclosures:
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J. Dyer	OGC
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EDO, 17 G 21	J. Lazevnick, EELB
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OFC	LA:PDIII-2	PM:PDIII-2	BC:EELB	D:PDIII-2		
NAME	TCLARK <i>JLC</i>	RASSA <i>RA</i>	CBERLINGER	JDYER <i>JDM</i>		
DATE	2/14/94	2/14/94	/ /94	2/15/94	/ /94	/ /94
COPY	<input checked="" type="checkbox"/> YES/NO	<input checked="" type="checkbox"/> YES/NO	YES/NO	<input checked="" type="checkbox"/> YES/NO	YES/NO	YES/NO

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COPY	<input checked="" type="checkbox"/> YES/NO	<input checked="" type="checkbox"/> YES/NO	YES/NO	<input checked="" type="checkbox"/> YES/NO	YES/NO	YES/NO

Commonwealth Edison Company

Byron/Braidwood Power Stations

cc:

Mr. William P. Poirier
Westinghouse Electric Corporation
Energy Systems Business Unit
Post Office Box 355, Bay 236 West
Pittsburgh, Pennsylvania 15230

U. S. Nuclear Regulatory Commission
Byron/Resident Inspectors Office
4448 North German Church Road
Byron, Illinois 61010-9750

Joseph Gallo, Esquire
Hopkins and Sutter
888 16th Street, N.W., Suite 700
Washington, D.C. 20006

Ms. Lorraine Creek
Rt. 1, Box 182
Manteno, Illinois 60950

Regional Administrator
U. S. NRC, Region III
801 Warrenville Road
Lisle, Illinois 6013

Mrs. Phillip B. Johnson
1907 Stratford Lane
Rockford, Illinois 61107

Ms. Bridget Little Rorem
Applesseed Coordinator
117 North Linden Street
Essex, Illinois 60935

Attorney General
500 South 2nd Street
Springfield, Illinois 62701

Mr. Edward R. Crass
Nuclear Safeguards and Licensing
Division
Sargent & Lundy Engineers
55 East Monroe Street
Chicago, Illinois 60603

Michael Miller, Esquire
Sidley and Austin
One First National Plaza
Chicago, Illinois 60690

U. S. Nuclear Regulatory Commission
Resident Inspectors Office
Rural Route #1, Box 79
Braceville, Illinois 60407

George L. Edgar
Newman & Holtzinger, P.C.
1615 L Street, N.W.
Washington, D.C. 20036

Mr. Ron Stephens
Illinois Emergency Services
and Disaster Agency
110 East Adams Street
Springfield, Illinois 62706

Commonwealth Edison Company
Byron Station Manager
4450 North German Church Road
Byron, Illinois 61010

Illinois Dept. of Nuclear Safety
Office of Nuclear Facility Safety
1035 Outer Park Drive
Springfield, Illinois 62704

Robert Neumann
Office of Public Counsel
State of Illinois Center
100 W. Randolph, Suite 11-300
Chicago, Illinois 60601

Commonwealth Edison Company
Braidwood Station Manager
Rt. 1, Box 84
Braceville, Illinois 60407

Chairman, Ogle County Board
Post Office Box 357
Oregon, Illinois 61061

EIS Review Coordinator
U.S. Environmental Protection Agency
77 W. Jackson Blvd.
Chicago, Illinois 60604-3590

Howard A. Learner
Environmental Law and Policy
Center of the Midwest
203 North LaSalle Street
Suite 1390
Chicago, Illinois 60601

Mr. D. L. Farrar, Manager
Nuclear Regulatory Services
Commonwealth Edison Company
Executive Towers West III, Suite 500
1400 OPUS Place
Downers Grove, Illinois 60515

Chairman
Will County Board of Supervisors
Will County Board Courthouse
Joliet, Illinois 60434

LIST OF MEETING ATTENDEES
FOR JANUARY 15, 1994

<u>NAME</u>	<u>AFFILIATION</u>
Rick Campbell	CECo/Byron SEC
Robert Kerr	CECo/Braidwood Engr & Cont. Mgr
Denise Saccamando	CECo/Braidwood NLA
Kurt White	CECo NETS
Joe Bauer	CECo License Administrator - Byron
Jim Abel	CECo Licensing
Jim Dyer	NRR/DRPW/PDIII-2
Dale Thatcher	NRR/DE/EELB
Jim Lazevnick	NRR/DE/EELB
Narinder Trehan	NRR/DE/EELB
Carl Berlinger	NRR/DE/EELB
John Knox	NRR/DE/EELB
Saba Saba	NRR/DE/EELB
Ramin Assa	NRR/DRPW/PDIII-2

**Technical Meeting
Commonwealth Edison
Company and the NRC**

**Byron and Braidwood
Stations
Proposed Battery
Replacement**

February 1, 1994

CURRENT BATTERIES

GNB Batteries NCX 1200

- Lead Calcium design
- Electrolyte Specific Gravity of 1.215
- 1200 ampere hour at the 8 hour rate to an end voltage of 1.75 volts/cell
- 20 year qualified life to IEEE 535

Station is Proactively Replacing the Batteries

- Nearing end of the service life (installed 1979)
- Performance of individual cells has been declining, however total battery output is at or near 100%.
- Replacement at this time not required by Tech Spec

REPLACEMENT BATTERIES

List 1SH Round Cell Battery (AT&T)

- Pure lead pasted plate design
- Electrolyte Specific Gravity of 1.300
- 1760 ampere hour at the 8 hour rate to an end voltage of 1.75 volts/cell
- 40 year qualified life to IEEE 535
- Greater life expectancy will preclude the need for battery change out
- Warranted to the manufacturer's minimum guaranteed rating

SIZING CALCULATIONS

- Batteries able to supply 107.9 volts at all times based upon design bases accident
- Aging Factor of 1.25 was included to allow for operation down to 80% capacity in accordance with IEEE 485 and IEEE 450
- Sized for a minimum electrolyte temperature of 60 degrees
- Design margin adequate to allow future load additions

SIZING WAS PERFORMED IN ACCORDANCE WITH APPLICABLE IEEE STANDARDS

IEEE 485, "Recommended Practice for Sizing Large Lead Storage Batteries for Generating Stations and Substations"

- Section 6.2.3 states: "ANSI/IEEE Std 450-1980 recommends that a battery be replaced when its actual capacity drops to 80% of its rated capacity; therefore, the battery's rated capacity should be at least 125% of the load expected at the end of its service life."

IEEE 450, "Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries for Generating Stations and Substations"

- Section 7: Battery Replacement Criteria, "Recommended practice is to replace the battery if its capacity as determined in 6.5 is below 80% percent of the manufacture's rating."

SIZING WAS PERFORMED IN ACCORDANCE WITH APPLICABLE IEEE STANDARDS (Continued)

IEEE 450 and IEEE 485 Standards are supported by our regulatory commitments:

- NUREG-0876 Safety Evaluation Report for Byron Stations.

- The systems are testable, independent and conform to the requirement of Regulatory Guides 1.32.
 - Reg Guide 1.32 requires that the test interval for the battery performance discharge test should be as specified in IEEE 450.

- FSAR Commitment
 - Regulatory Guide 1.129 endorses the IEEE 450 standard.

REVIEW OF OTHER INDUSTRY AMENDMENTS

McGuire Nuclear Station

- Approved July 1, 1991
- Tech Spec requires 60 month surveillance to verify that the battery capacity is at least 80% of the manufacturer's rating.

Palo Verde Nuclear Station

- Approved March 6, 1992
- Tech Spec requires 60 month surveillance to verify that the battery capacity is at least 90% of the manufacturer's rating.
- Also requires additional test//surveillances if degradation of 5% occurs or capacity falls below 90% of the manufacturer's rating.

Note: Both submittals referenced IEEE Standards.

REVIEW OF OTHER INDUSTRY AMENDMENTS

NUREG 1431 Standard Technical Specifications Westinghouse Plants

- Approved September 28, 1992
- Maintains surveillance to verify battery capacity is greater than or equal to 80% of the manufacture's rating when subjected to a performance discharge test.
- Bases Section states that the acceptance criteria for this surveillance are consistent with IEEE 450 and IEEE 485. These references recommend that the battery be replaced if its capacity is below 80% of the manufacturer rating.

Concluded that IEEE 450 and IEEE 485 did apply as well as current Technical Specifications.

- Technical Specification 4.8.2.1.2.e , "At least once per 60 month, during shutdown, by verifying that the battery capacity is at least 80% of the manufacturer's rating when subjected to a performance discharge test. This performance discharge test may be performed in lieu of the battery service test required by Specification 4.2.1.2.d."

DISCUSSION OF NRC CONCERN / CEC_o POSITION

NRC contends that the existing Technical Specification for capacity test is not appropriate at 80%.

CECo concurs with the NRC that it would be prudent to increase the current Technical Specification, but believes that raising it to 100% is impractical.

Capacity measurement uncertainty could result in lower than anticipated results

- Measurement uncertainty is approximately 2%

Economic Issues

- Battery Warranty
 - Vendor will replace at less than 100% capacity
 - Battery change out at 100% or greater capacity would not allow CEC_o to take advantage of the replacement warranty
 - Replacement cost approximately \$200,000/unit

DISCUSSION OF NRC CONCERN / CEC_o POSITION

(Continued)

Technical Specifications surveillances ensures continued monitoring of battery performance.

- Monitor performance of the pilot cell - Weekly
- Monitor performance of all cells - Quarterly
- Perform service test - Eighteen Months
- Perform discharge test - 60 months (in lieu of the service test)

Historically, Braidwood and Byron Engineering exercised hood engineering judgement

- Trending and maintaining systems
- Replacing equipment without Technical Specification requirement
- Replacement of the current batteries is not required by Technical Specification at this time.

PROPOSED TECH SPEC ENHANCEMENTS

Increase in battery capacity spec to 95%.

Technical Specification Section 4.8.2.1.2.e, "At least once per 60 months, during shutdown, by verifying that the battery capacity is at least **95%** of the manufacturer's rating when subjected to a performance discharge test. This performance discharge test may be performed in lieu of the battery service test required by Specification 4.8.2.1.2d."

Prudent to perform increase capacity testing if:

- Performance is less than 100% of the manufacturer's rating
 - Increased from 90%
- Battery capacity drops more than 5% of rated capacity from its average previous tests
 - Decreased from 10%

Technical Specification Section 4.8.2.1.2.f will be revised to read, "At least once per 18 months during shutdown by giving performance discharge tests of battery capacity to any battery that shows signs of degradation or has reached 85% of the service life expected for the application. Degradation is indicated when the battery capacity drops more than 5% of rated capacity based on the previous performance test, or is below 100% of the manufacturer's rating."

Summary

- CECO exercised prudent engineering judgement when sizing the batteries
 - Based upon applicable standards
 - Other industry amendments
- New technology of the round cell battery warrants enhancements to the current Technical Specifications with regard to capacity
- CECO believes that it is impractical to increase the capacity threshold to 100%
 - Variations in test data
 - Economics (Warranty)
- Replacement capacity of 95% proposed.